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Marlene H. Dortch, Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: ET Docket No. 13-49

Dear Ms. Dortch:

On behalf of the Wireless Internet Service Providers Association (“WISPA”), this letter responds to the late-filed pleading submitted in the above-referenced proceeding on July 11, 2016 by the Aerospace and Flight Test Radio Coordinating Council, Inc. (“AFTRCC”).¹ As shown herein, AFTRCC’s self-styled “Ex Parte Statement”² is simply an ill-disguised effort to file an untimely opposition to WISPA’s Petition for Partial Reconsideration (“Petition”) submitted earlier in this proceeding.³ The Commission should dismiss the unauthorized AFTRCC pleading in its entirety as procedurally defective. Further, as discussed below, AFTRCC’s claims concerning harmful interference to its facilities are unavailing.

On May 6, 2016, WISPA filed a timely Petition for Partial Reconsideration (“Petition”) of the Commission’s April 6, 2016, Memorandum Opinion and Order (“*Order*”) in this proceeding.⁴ A summary of the *Order* was published in the Federal Register on April 6, 2016

¹ See Letter from William K. Keane, Counsel to AFTRCC, to Marlene S. Dortch, FCC Secretary, ET Docket No. 13-49 (filed July 11, 2016) (“AFTRCC Letter”). It should be noted that the Docket cited AFTRCC does not exist. The AFTRCC opposition cites “WT Docket No. 13-49.” The correct Docket is “ET Docket No. 13-49.”

² Under any objective reading, the late-filed AFTRCC Letter is an “Opposition” under the Commission’s longstanding rules and policies, and it’s easy to see that the pleading was specifically prepared and drafted to rebut and oppose the points raised in WISPA’s Petition. In other words, this is a *prima facie* case of a party missing a filing deadline, then trying to file an impermissible pleading into a proceeding through the “back door,” despite being specifically forbidden to do so after a Commission-mandated deadline had passed.

³ See WISPA Petition for Partial Reconsideration, ET Docket No. 13-49 (filed May 6, 2016).

⁴ See *Revision of Part 15 of the Commission’s Rules to Permit Unlicensed National Information Infrastructure (U-NII) Devices in the 5 GHz Band*, Memorandum Opinion and Order, ET Docket No. 13-49, FCC 16-24 (rel. March 2, 2016).



and established May 6, 2016 as the deadline for filing Petitions for Reconsideration in the proceeding.⁵ WISPA's Petition was timely filed on May 6, 2016, and public notice of the filing of the Petition was subsequently published in the Federal Register on June 8, 2016.⁶ The Federal Register publication expressly stated that Oppositions to the Petitions must be filed on or before June 23, 2016.⁷

Despite this precise deadline, AFTRCC nonetheless filed its opposition on July 11, 2016, in violation of both the Federal Register mandate and Section 1.429 of the Commission's Rules.⁸ That rule governs the filing of oppositions to petitions for reconsideration and unequivocally states in part that "Oppositions to a petition for reconsideration shall be filed within 15 days after the date of public notice of the petition's filing..."⁹ Pursuant to the Commission's Rules, the AFTRCC filing is procedurally defective and thus should be summarily rejected by the Commission.

The Commission's consideration of the AFTRCC opposition could end there, but it should nevertheless note that AFTRCC provides no legitimate justification for its impermissible filing, other than to state that the Petition had "recently come" to AFTRCC's attention, which, for an entity like AFTRCC that has lengthy experience before the Commission, is really no justification at all.

Although the AFTRCC filing is procedurally defective, WISPA is nonetheless compelled to refute AFTRCC's substantive allegations. The attached Technical Statement of Fred Goldstein explains that aeronautical mobile telemetry ("AMT") protection is required in only a small portion of the United States, and that maintaining restrictive out-of-band emission ("OOBE") rules nationwide would be excessive and unnecessary. This is because there are a relatively small number of AFTRCC facilities, all of which operate with elevation-plane antenna directionality. Limiting protection to these facilities on a location-by-location basis would alleviate AFTRCC's generalized concern that "outdoor, higher power devices would not light up 'next door'" in a manner that would cause harmful interference,¹⁰ while enabling U-NII-1 devices to operate with less restrictive OOBE.

As the Technical Statement demonstrates, a 7 km restricted radius around each telemetry receiving station would be a far more efficient and appropriate sharing solution than outright prohibiting the relaxed OOBE limits proposed in the WISPA Petition. Raising the allowable OOBE by 20 dB would increase the free-space range tenfold, to 70 km. Taking into account the curvature of the Earth, if not terrain and clutter, and the fact that the telemetry antenna is usually not pointing at the horizon and may not require full-circle protection, the actual potential

⁵ See 81 Fed. Reg. 19896 (April 6, 2016). See also Section 47 C.F.R. § 1.429(d) (petitions for reconsideration shall be filed within 30 days from the date of public notice of such action, as that date is defined in § 1.4(b)).

⁶ See 81 Fed. Reg. 36858 (June 8, 2016).

⁷ *Id.* (emphasis added).

⁸ 47 C.F.R. § 1.429(f).

⁹ *Id.*

¹⁰ AFTRCC Letter at 3.



interference areas would be reduced even further for U-NII-1 devices not mounted very high above average terrain.

AFTRCC also asserts that there is a meaningful difference between “licensed” and “unlicensed” devices. AFTRCC creates the false impression that any party, including any consumer, could simply install a Part 15 unlicensed device without regard for any restrictions placed on its use. This claim fails also, because the outdoor point-to-point use of U-NII-1 systems is subject to professional installation. In short, AFTRCC’s argument fails because the U-NII-1 devices are subject to professional installation that prevents end-user installation that might be subject to a higher level of protection.

Because AFTRCC locations are known and can be protected via elevation-plane antenna directionality and professional installation, the Commission can establish limited geographical protection zones to facilitate spectrum sharing among AFTRCC and U-NII-1 users. For these reasons and those provided by WISPA and others throughout this proceeding, the requested less stringent OOB limit would not create harmful interference to protected services in the adjacent 5.091-5.15 GHz band and that relaxing the limits will further the public interest by promoting broadband deployment and access. There is nothing in AFTRCC’s letter to show otherwise. Accordingly, the Commission should reject AFTRCC’s procedurally and substantively defective filing and grant WISPA’s otherwise unopposed Petition.

Respectfully submitted,

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Counsel to WISPA

cc: Julius Knapp
Bruce Romano
Karen Rackley
Aole Wilkins
Jamison Prime
William K. Keane

Technical Statement of Fred Goldstein

My name is Fred Goldstein, and I am a Principal of Interisle Consulting Group (“Interisle”). Interisle is a partnership of network and systems experts. I have been working in the telecommunications field for almost 40 years, working with the PSTN, enterprise and government networks, radio systems, cable, and ISPs, and have provided expert witness services to a range of CLECs, attorneys, and government agencies.

Interisle has been retained by the Wireless Internet Service Providers Association (“WISPA”) to assist in supporting WISPA’s Petition for Partial Reconsideration (“Petition”) in response to the letter submitted on July 11, 2016 by the Aerospace and Flight Test Radio Coordinating Council, Inc. (“AFTRCC”). The position taken by AFTRCC is needlessly restrictive, and a much more narrowly-tailored approach will be sufficient to protect their operations while allowing U-NII-1 users to have meaningful access to more of that band.

Flight test telemetry takes place over only a small part of the country. And it is the fixed receive location of the facility that requires the most protection. In similar cases, such as in the 3650-3700 MHz band where rules protect incumbent fixed satellite service earth stations, the Commission had established geographic protection zones around fixed earth stations to ensure protection from harmful interference. Flight test telemetry receive sites could likewise be provided with protection zones in areas where actual harmful interference is possible. Within these defined zones, the current U-NII-1 -27 dBm/MHz limit on peak OOB and the Section 15.209 restricted band 41 dBm/MHz limit on average OOB would apply, while also taking antenna height into account. Flight test telemetry receive antennas are highly directive and point at the airplane, which presumably is located above the horizon, so the antenna gain towards a U-NII-1 antenna near the ground, or at a device located at distance where the curvature of the Earth impedes the path, should be considerably lower than its rated peak gain.

Accordingly, because aeronautical mobile telemetry (“AMT”) protection is required in only a small portion of the United States, the sensible approach would be to develop a spectrum sharing method that would allow AMT and U-NII operations to coexist and to permit effective and full development of valuable U-NII frequencies. Because there are relatively few AMT facilities and their locations are mostly well-known, limiting protection to these facilities on a location-by-location basis would alleviate AFTRCC’s generalized concern that “outdoor, higher power devices would not light up ‘next door’” in a manner that would cause harmful interference.¹

We have been led to believe that AFTRCC considers the precise locations of some of its members’ receive stations to be secret. Even if this is true, the Commission could, in cooperation with AFTRCC or its members, define carefully-tailored protection zones around these sites. This

¹ AFTRCC Letter at 3.

would still exclude the vast majority of the country, where it is not necessary, from needing to provide a high level of protection when no receive stations are potentially within range, especially if elevation is taken into account.

By analogy, ITU-R Recommendation M.1459, which discusses interference mitigation between aeronautical telemetry and satellite broadcast systems on frequencies below 2360 MHz, states that “[t]he maximum air space for a telemetry receiving site is defined as a cylinder with a horizontal radius of 320 km around the site, with the lower bound determined by visibility and the upper bound determined by an altitude of 20 km.”² That is, the maximum 320 km range of L-band aeronautical telemetry systems (which is likely more distant than the 5 GHz systems in question) applies at higher flight altitudes, but not to areas beyond the line of sight. Similar considerations could be taken into account for U-NII-1 point-to-point systems, so that systems operating on high towers or mountaintops might be ineligible to emit OOB at higher than -27 dBm/MHz in a wider radius than those closer to ground.

A significant distinction between U-NII-1 and the coexistence case described in ITU-R Recommendation M.1459 is that in the latter case, co-channel operation of satellites is assumed, while in the U-NII-1 case, only OOB is at issue. The question is thus how much attenuation of OOB is required in order to protect the telemetry receive station, and thus how close to it the potential interferer must be to violate this. Using the current OOB average level of -41 dBm/MHz specified for restricted bands in Section 15.209, the potential interference radius can be computed using the Friis equation solving for range R:

- a) an emitted average power spectral density = $P_t = -41$ dBm/MHz at 5.15 GHz
- b) worst case for the interferer – free-space propagation (no clutter assumed)
- c) free-space path loss (fspl) at 1 meter = -47 dB
- d) the interference level received by the victim must be 8 dB below the noise floor to have an effect
- e) telemetry Rx bandwidth = 1 MHz for a sensitivity of -112 dBm (-114 dBm noise floor, 2 dB noise figure)
- f) telemetry receive antenna gain $G_r = 45$ dB

$$R = 10^{(P_t + \text{fspl} + G_r - P_r)/20} = 10^{(-41 - 47 + 45 - (-112 - 8))/20} \approx 7 \text{ km}^3$$

Based on this formula, a 7 km restricted radius around each telemetry receiving station (only 154 km nationwide) would be a far more efficient and appropriate sharing solution than

² See ITU-R Recommendation M.1459.

³ See, for instance, https://en.wikipedia.org/wiki/Friis_transmission_equation.

outright prohibiting the relaxed OOB limits proposed in the WISPA Petition. Raising the allowable OOB by 20 dB would increase the free-space range tenfold, to 70 km. Taking into account the curvature of the Earth, if not terrain and clutter, and the fact that the telemetry antenna is usually not pointing at the horizon and may not require full-circle protection, the actual potential interference areas would be reduced even further for U-NII-1 devices not mounted very high above average terrain.

The combination of known AFTRCC locations, elevation-plane antenna directionality and professional installation of U-NII-1 devices suggests that geographical protection zones can facilitate spectrum sharing between AFTRCC and U-NII-1 users.

Fred Goldstein

Fred Goldstein

24 August 2016